MEMORIALS

OF

JAMES P. ESPY AND OF THE PHILADELPHIA LYCEUM,

PRAYING

The aid of the General Government in making a series of meteorological observations.

MAY 2, 1838.

Referred to the Committee on Commerce, and ordered to be printed.

To the honorable the Senate and to the honorable the House of Representatives in Congress assembled :

GENTLEMEN : In presenting the enclosed memorials, marked A and B, asking Congress to make an appropriation to aid in the advancement of meteorology, I feel it incumbent on me to state a few plain reasons why Congress is requested to make the appropriation prayed for.

In the first place, it is not in the power of individuals, however zealous they may be, to accomplish the object in view. Great exertions have been made by the joint committee of the American Philosophical Society and the Franklin Institute, to procure an extensive series of observations on storms, &c., but for want of instruments to offer to observers, their efforts have not been successful. And the experience which this committee have had since the State of Pennsylvania appropriated $4,000 for the purchase of instruments to be located in the several counties of the State, justifies me in saying no difficulty will be experienced in procuring faithful observers, if they are furnished with instruments to make the observations with.

In the second place, a discovery of the causes of storms, &c., has lately been made, from which it can be known, while a great storm is yet several hundred miles off, in what direction it is from the observer. And it follows as a corollary, that the observer only wants to know in what direction the storm is moving along the surface of the earth, to enable him to tell whether that storm is about to reach him or pass to his right or his left. Now, if there is any regularity in the motion of storms from one part of the United States to another, this regularity can only be found out by just such a series of simultaneous observations as is proposed to be made by the aid of Congress. All this appears from the testimony of the joint committee of the American Philosophical Society and the Franklin Institute, and of other scientific men. (See papers enclosed.)

In the third place, if the cause of storms had not been found out, it is manifest that the plan proposed is the only one from which success in making discoveries can be anticipated.

Blair & Rives, printers.

Again, the sum of money required, though too great for individuals to raise, is so small, in comparison with the magnitude of the object, that no objection can be made to the appropriation on that ground. The saving of one ship at sea would cover the whole expense incurred in five years' observations, paying for 300 complete sets of meteorological instruments, and affording a salary for a meteorologist and his assistant.

Another reason, which ought to have great weight with those members of Congress who may not have time to examine the subject for themselves, is, that it is the opinion of the most scientific men in our country, that most important information to the farmer and mariner, and, indeed, to every citizen, would result from the proposed series of simultaneous observations.

Cuique credendum est in suâ artê.

To substantiate this point, I copy the following certificate which I received in 1836:

"We, the subscribers, hereby certify that we have examined Mr. Espy's theory of rain, hail, and snow, water-spouts and tornadoes, variable winds, cross-currents of air, and barometric fluctuations, and we do not hesitate to declare that his explanation of these phenomena is entirely satisfactory to us; and, moreover, it follows from his theory, and facts ascertained since its discovery, that any observer acquainted with it may know in what direction a great storm is raging, while that storm may be yet several hundred miles from him. And, moreover, we believe if our Government would cause simultaneous observations to be made, on the plan proposed by him, over a wide extent of territory, most important information to the farmer and mariner would be the result.

JOHN LOCKE,
Prof. Med. College, Cincinnati, Ohio.
WALTER R. JOHNSON,
Prof. of Scientific Expedition.
HENRY VETHAKE,
Prof. Math. University Pennsylvania.
RICHARD HARLAN, M. D.,
Member American Philosophical Soc.
PAUL B. GODDARD, M. D.,
Member Academy Natural Science.
ISAIAH LUKINS,
Member American Philosophical Soc.
JOSEPH HENRY,
Professor, Princeton, New Jersey.
ROSWELL PARK,
Prof. Nat. Phil. and Chem., Univ. Pa.
CHARLES D. MEIGS, M. D.,
Sec'y American Philosophical Society."

I copy, also, the following letter, which, it will be seen, is from several of the most scientific men of Boston. The name of Nathaniel Bowditch alone ought to insure success to the present application. The recommendation of such a man would be listened to with the greatest respect by any Government in Europe.

"CAMBRIDGE, *November* 11, 1837.

DEAR SIR: We heartily wish you success in your efforts to interest the members of the General Government in the science of meteorology, and we sincerely hope that you will be able to convince them of the importance of public aid, as well as its propriety, in the further progress of this science. The disconnected observations of isolated observers are almost useless; and hardly any private exertions could command observations so numerous, accurate, and uniform, so widely extended over the country and continued for so long a time, as to insure success in the discovery of the laws which regulate the phenomena of the weather. Under these circumstances, it cannot be thought impertinent to request the aid of Government; nor would it appear inconsistent with the wisest economy and good judgment on the part of our rulers, to extend assistance to a science in which every member of the nation is interested.

Yours respectfully,

BENJAMIN PIERCE,
Prof. Math. and Nat. Phil., Harvard Univ.
DANIEL TREDWELL,
Rumford Prof. in Harvard University.
JOHN WARE,
Hervey Prof of Theory and Practice of Physic, Harvard University.
J. W. WEBSTER,
Prof. Chemistry, Harvard University.
NATHANIEL BOWDITCH.
JOSEPH HOPKINSON,
Vice President American Phil. Society.
PETER S. DUPONCEAU,
President American Phil. Society.
N. CHAPMAN, M. D.,
Vice President American Phil. Society.

To Prof. ESPY."

The opinion of the joint committee of the American Philosphical Society and the Franklin Institute, "on meteorolgy," will no doubt receive attention on this subject. It will be seen in their third report, that they say: "From the principles here developed, it will be easy, when a great storm springs up, or comes within disturbing influence, to tell in what direction it is raging; but we must not stop here; it is not enough to know *where* it is raining at a given time; we must know *when* it will rain where we are. For this purpose, it is of primary importance to know the direction in which storms move, and, also, their velocity, in all the different seasons of the year.

"We would suggest, as the most effectual, perhaps the only, means of attaining this end, an appropriation by Government for the purchase of meteorological instruments, to be presented to those academies, schools, and colleges, that would pledge themselves to keep a journal of the weather, according to a prescribed plan, for five years, and send a monthly statement to a meteorologist to be appointed by the Government. With three hundred observers, properly located, no storm could spring up within or enter

the United States, without being under the eye of at least two observers. And thus its extent, its progress, and the direction of the wind in its borders, would be fully known."

The report from which this extract is taken, is signed :

J. P. ESPY,
Chairman of Joint Committee.
CHARLES N. BANCKER,
GOVERNEUR EMERSON, M. D.,
ALEX. DALLAS BACHE,
President Girard College,
ROBLEY DUNGLISON, M. D.,
Prof. Physiology, Jefferson College.
JOHN K. KANE,
Secretary American Phil. Society.
Committee of American Phil. Soc.
JAMES P. ESPY,
ALEX. DALLAS BACHE,
HENRY D. ROGERS,
Geologist State of Pennsylvania, &c.,
SEARS C. WALKER,
PAUL B. GODDARD, M. D.,
ROBERT M. PATTERSON, M. D.,
JOHN C. CRESSON,
Prof. Nat. Phil. Franklin Inst.,
RUFUS TYLER,
Committee of Franklin Institute.

PHILADELPHIA, *December* 14, 1836.

So far as the names of scientific men, in favor of the proposed plan of simultaneous observations, should have weight, it is believed that no more need be mentioned, though it cannot be doubted that every scientific man in the country, if applied to, would give it his sanction, even if he was unacquainted with the discovery alluded to above.

I earnestly pray you, then, gentlemen, to listen to the united voice of scientific men, and grant that aid to this most interesting department, which can alone enable it to take its rank among the exact sciences.

As it is the grand desideratum in this science to know in what direction and with what velocity storms move along the surface of the earth in the different seasons and different latitudes, and, also, the direction of the winds below and the clouds above, during their progress near and beyond their borders, I would recommend that you make it the duty of your meteorologist to procure skeleton maps of the territory embraced by the simultaneous observations ; and that he should trace on these maps the progress of all important storms, indicating the size and shape of the storm by some appropriate color, and the strength and direction of the wind, by arrows of different lengths, and of the clouds above by arrows of a different color. And thus the reader, by a glance of his eye over these *meteorological maps*, may be able to see and comprehend all the most important phenomena attending a storm.

Even the rise and fall of the barometer, and the moment of its greatest elevation and depression preceding and accompanying these storms, could

be indicated by appropriate marks on these meteorological maps; and thus the reader would be able to tell, from these maps alone, without referring to the original observations, whether the wind, in any particular place, blew by aspiration or impulsion; a fact of great importance in the further investigation of storms.

These meteorological maps, together with written generalizations of the principal phenomena attending storms of sufficient magnitude to be interesting, should form the annual report of your meteorologist to Congress; and should be published and sent to every observer who shall furnish a journal of the weather, according to the plan prescribed by the meteorologist.

The original journals, themselves, which may, perhaps, be too voluminous to publish, should be carefully preserved in the bureau of the meteorologist—an inexhaustible fund of knowledge, on which the present and future meteorologist may draw without end. If, however, Congress, in their wisdom, should see proper to make provision for publishing the journals entire, so as to lay this fountain of knowledge more open to scientific men, that a thousand minds may at once be brought into action, each endeavoring to solve the mighty problem—*to predict the approach of a storm in time to prepare for its arrival*—I should be highly gratified with their determination.

As it would be unphilosophical and dangerous to navigation, to infer that all the phenomena attending storms in the United States, would also be found connected with storms at sea, and in the West India islands, I would recommend that your meteorologist be authorized to locate in the West Indies 60 sets of meteorological instruments; four sets in Bermuda, four sets in Newfoundland, and four in the Azores; and that means be furnished to induce masters of vessels sailing between the United States and Europe, and between the United States and the West Indies, to send a copy of their meteorological journals at sea to your meteorologist. This extension of the observations would add great value to the whole series, especially as it has been demonstrated by the highly interesting and valuable investigations of Mr. William Redfield, of New York, that the great storms which originate in the West India islands, as far south as the Windward islands, first travel northwest, then north, and finally northeast, along the coast of the United Strtes. And, from a paper by Mr. Sears C. Walker, a gentleman distinguished for his knowledge in practical astronomy, herewith communicated, it appears that at least one great storm reached the shores of Europe in about five days after passing Philadelphia; which accords with the velocity with which Mr. Redfield has shown these storms traverse the United States, and confirmed by the investigations of the joint committe. (See first report of J. Com.)

Finally, if you should choose rather to make the appropriation from your own knowledge of its probable utility, than from the recommendation of scientific men, I pledge myself to demonstrate to you, or to any committee which you may appoint, if you or they will give me a patient hearing of three or four hours, that a principle has been discovered lately, which explains all the phenomena abovementioned; and that many highly curious and highly interesting corollaries follow from the discovery; among which may be mentioned, that the height of the base or lower part of cumulus clouds, when forming, may be ascertained by the thermometer; that the direction in which a great storm is raging may be known, when that storm

is yet many hundred miles from the place of observation; and that nothing is now wanting to enable the observer to tell whether the storm, whose direction is thus known, will reach the observer, or pass to his right or his left, but a knowledge of the direction in which storms move along the surface of the earth, in all the different seasons of the year, in the different latitudes.

Yours, respectfully,
JAMES P. ESPY.

PHILADELPHIA, *December* 12, 1837.

A.

To the Senate and House of Representatives of the United States in Congress assembled:

This memorial of the Pennsylvania Lyceum

RESPECTFULLY REPRESENTS:

That James P. Espy, Esq., of the city of Philadelphia, has discovered the principles and laws which govern the weather in the production of all kinds of storms.

We consider this to be one of the most important discoveries of modern times, inasmuch as by it many of the phenomena of meteorology will be subjected to the control of man.

When reduced to practical operations, as we believe it may be, it will be of incalculable advantage to our country, and of great importance to mankind, by enabling the mariner to anticipate the approach of storms at a great distance and a length of time before they occur; and also by securing to the farmer, manufacturer, and mechanic who are interested in forestalling the state of the weather, the ability to do so with certainty.

In order to effect these objects, however, it is absolutely necessary that simultaneous observations be made over extensive regions of country.

We therefore petition your honorable body to lend this enterprise the fostering aid of Government in such way as will enable Mr. Espy to prosecute his investigations upon a scale commensurate with the importance of the object.

JAMES CULBERTSON,
President pro tem. of the Pennsylvania Lyceum.
WM. HALE, *Secretary.*

MEMBERS IN ATTENDANCE.

William E. Morris	Jacob G. Ketteman
H. N. McAllister	A. Blynnger
Claudius B. Linn	Samuel Alsop
William P. Orbison	Philip Erringer
Lot W. Irvin	James W. Kerr
A. G. Curtin	Isaac Fisher

W. A. Rinsloe
N. Dodge
S. W. Fuller
J. D. Relp
John Simmons
R. C. Hale
J. T. Hale

B.

PROCEEDINGS OF THE AMERICAN LYCEUM.

The committee appointed at a former session to prepare a petition to Congress relative to meteorological observations, reported the following memorial:

To the Senate and House of Representatives of the United States in Congress assembled:

The memorial of the American Lyceum

RESPECTFULLY REPRESENTS:

That the science of meteorology has not heretofore received that attention which its great importance to the farmer, mechanic, and mariner demands and would justify, and consequently has not taken its rank among the exact sciences; and that, since all nature is governed by fixed laws, which, in some cases, can only be developed by extensive systematic observation, carried on simultaneously over a large extent of country, (an object of too great magnitude to be accomplished by any individual association, and worthy the attention of the National Legislature,) therefore we would respectfully ask Congress to make such an appropriation as will certainly cause these simultaneous observations on storms and atmospheric phenomena to be made throughout the whole length and breadth of the land; and also to secure the individual attention of an able meteorologist to this important subject, whose duty it should be to collate, and, if possible, deduce from them the general laws which govern the weather.

The memorial was unanimously adopted, and Mr. J. P. Espy, Mr. H. C. Corbit, and Mr. Samuel Webb were appointed a committee to have it presented to the next Congress.—*Sitting of May* 10, 1837.